

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of: Oleg SULIMA

Ser. No.: 10/586,193

Group Art Unit: 2826

Filed: May 5, 2008

Examiner: Fazli Erdem

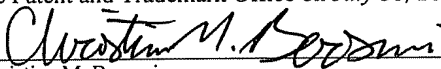
Confirmation No.: 4885

For: PHOTOTRANSISTORS, METHODS OF MAKING PHOTOTRANSISTORS, AND
METHODS OF DETECTING LIGHT

M.S. Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

CERTIFICATION OF EFS TRANSMISSION

I hereby certify that this paper is being transmitted via EFS to
the Patent and Trademark Office on *July 30, 2009*.


Christina M. Bersani

REQUEST FOR RECONSIDERATION

Sir:

In response to the Office Action mailed March 31, 2009, Applicants respectfully
request reconsideration and withdrawal of the rejections of record based on the following
arguments.

Claims 1-49 are pending herein.

Claims 1, 2, 19, 21 - 24, 26 - 34, 48, and 49 were rejected under 35 U.S.C. §102(b)
over U.S. Patent 6,452,242, (hereinafter Razeghi '242).

Claim 1 recites a phototransistor comprising an emitter comprising antimony; a base
comprising antimony, said base comprising an emitter-contacting portion which is in contact
with a base-contacting portion of said emitter, and a collector comprising antimony, said
collector comprising a base-contacting portion which is in contact with a collector-contacting

portion of said base. Claim 1 further recites that the phototransistor produces an internal gain upon being contacted with light within a receivable wavelength range.

Razeghi '242 discloses a multicolor p-n detector consisting of two adjacent p- and n-doped layers and one undoped layer (lower contact). This structure is not a phototransistor structure. In particular, Razeghi '242 discloses that a "wide bandgap material such as AlInSb or GaInSb is grown on a substrate to form a lower-contact layer. An n-type active layer is lattice matched to the lower contact layer and doped. The active layer is a narrow bandgap material, such as InAsSb. A p-type upper contact layer is then grown on the active layer doped and the structure is annealed" (Razeghi '242, Col. 1, lines 53 - 59).

Razeghi '242 discloses a multicolor detector, not a phototransistor. As only a p-type upper contact layer, n-type active region and undoped contact layer are disclosed, this structure cannot operate as a phototransistor. Moreover, Razeghi '242 never mentions the parts specific for a phototransistor, namely, emitter, base and collector. The basic structure of the device of the present invention is of an n-p-n or p-n-p type, which is substantially different from the basic structure of Razeghi '242.

Razeghi '242 further discloses a "possible third type of structure is an npn (or pnp) phototransistor" (Razeghi '242, Col. 5, lines 10 - 11). Although in a very general form Razeghi '242 mentions in the Example a possibility of making an n-p-n or p-n-p phototransistor, only an undoped lower contact layer is disclosed. Neither n- or p-type doping is mentioned when referring to the lower contact.

To anticipate a claim under 35 U.S.C §102(b), a single reference must contain all of the elements of the claim. In addition, the elements must be arranged as required by the claim MPEP §2131. For alleged disclosure of the claimed elements, the Office Action contains a statement that "Razeghi teaches a phototransistor comprising a substrate comprising antimony

(column 2, lines 29 - 30)...” (Office Action dated March 31, 2009, hereinafter “OA 03/09”, Page 2). From this, it appears that the Office Action is assuming the substrate of Razeghi ‘242 to be equivalent to the claimed “base comprising antimony”.

Here, Razeghi ‘242 fails to disclose, and the Office Action fails to support, a phototransistor comprising at least an emitter, a base, and a collector. In addition, Razeghi ‘242 fails to disclose, and the Office Action fails to support, that these elements comprise antimony. Further, Razeghi ‘242 fails to disclose, and the Office Action fails to support, the elements as arranged in the claim as is required. For example, Razeghi ‘242 is completely silent with regards to a base having “an emitter-contacting portion which is in contact with a base-contacting portion of said emitter”, as claimed. Likewise, Razeghi ‘242 is completely silent with regards to a “collector comprising a base-contacting portion which is in contact with a collector-contacting portion of said base”, as recited in Claim 1. Razeghi ‘242 is lacking any disclosure of the limitations as arranged in the claims.

Accordingly, for at least the reasons that Razeghi ‘242 fails to disclose and the Office Action fails to support the various elements such as an emitter, a base, and a collector, as well as the manner that they are arranged, Claim 1 is patentable over Razeghi ‘242. Claims 2, 19, 21 - 24, 26 - 29, 48 - 49, which depend directly or indirectly from Claim 1, are therefore also patentable over Razeghi ‘242.

Independent Claims 30 and 31, like claim 1, each recite an emitter, collector and base comprising antimony. Therefore, they are both novel and inventive for reasons analogous to those discussed above with reference to Claim 1. Analogous to claim 1, method claim 33 recites a method for making a phototransistor, including forming an emitter, base, and collector, each comprising antimony. As discussed above, these elements are neither disclosed in Razeghi ‘242 or supported by the Office Action. Accordingly, Claims 30, 31, and 33 are

patentable over Razeghi '242. Likewise, Claims 32 and 34, which depend from Claims 31 and 33, respectively, are also patentable over Razeghi '242. It is respectfully requested that the United States Patent and Trademark Office reconsider and withdraw this rejection.

Claims 3 - 10, 25, 35, 36, 43 - 45 were rejected under 35 U.S.C §103(a) over Razeghi '242 in view of U.S. Patent 5,124,771 (hereinafter, Taira '771).

Claims 3 - 10 and 25 depend from Claim 1. Claims 3 - 5 include limitations regarding the compositions of the base, emitter and collector. Claims 6 - 10 recite limitations regarding the band gap gradients and values between the layers. Claims 35, 36 and 43 - 45 depend from Claim 33. Claim 35 recites a buffer layer, Claim 36 recites a contact layer, and Claims 43 - 45 recite the compositions of the emitter, base, and collector.

Razeghi '242 is relied on as discussed above. Taira '771 is directed to a semiconductor device, in particular, a n-i-n-i-n hot electron transistor (Taira '771, Figure 2).

The U.S. PTO notes that Razeghi fails to disclose the required composition of the layers, named by the U.S. PTO (and not by Razeghi) as base, emitter and collector, and refers to the invention of Taira and states that "it would have been obvious to include the required composition for emitter, collector and the base layers in Razeghi as taught by Taira in order to have a semiconductor device with improved saturation characteristics." This statement has no basis in the applied references, because the invention of Taira is related to a different device (n-i-n-i-n hot electron transistor), which – contrary to the present invention – is not an optoelectronic device at all. Moreover, Razeghi does not disclose any desire for "improved saturation characteristics" (nor is it a goal of the present invention) which makes the above statement of the U.S. PTO irrelevant.

The motivation for a combination of references must come from the prior art and not from Applicant's disclosure. Here, Razeghi '242 discloses only the possibility for a phototransistor, and is silent with regard to the components of such a device and how they would be arranged. Taira '771 is directed to a completely different device from that of Applicant. Moreover, the alleged reason for the combination, i.e., "improved saturation characteristics" would not motivate one to do what Applicant has done because the "improved saturation characteristics" of semiconductors is irrelevant to the phototransistor device as claimed. As one skilled in the art is aware, the elements, materials, and arrangements used in these devices are very specific and can not be interchanged easily, especially in light of the desired wavelength sensitivity. The Office Action fails to show motivation for the alleged combination and how the proposed combination would work for its intended purpose. Obviousness requires all claimed elements to be disclosed. Here, neither reference, nor any valid combination, discloses all elements, and since there is no motivation to combine the references, no *prima facie* case of obviousness has been established.

As discussed above, Claims 1 and 33 are patentable over Razeghi '242. It is respectfully noted that any such disclosure of Taira '771 of does not overcome any shortcomings of Razeghi '242 as attempted to be applied to Claims 1 and 33, from which Claims 3 - 10, 25, 35, 36, 43 - 45 depend. Therefore, Claims 3 - 10, 25, 35, 36, 43 - 45 are patentable over the cited references for at least the reasons discussed above.

Applicants thank the Examiner for the indication that Claims 11 - 18, 20, 37 - 42, 46 and 47 would be allowable if rewritten in independent form, as the "prior art failed to establish claimed materials and base bandgap gradient" (OA 03/09, Page 2). Given the discussion above, Applicants believe that all the claims are in condition for allowance.

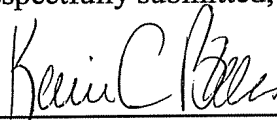
If the Examiner believes that contact with Applicants' attorney would be advantageous toward the disposition of this case, the Examiner is herein requested to call Applicants' attorney at the phone number noted below.

The Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 50-1446.

July 30, 2009

Date

Respectfully submitted,



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